

ZEFIROV, L.N.; POLETAYEV, G.I.

Some mechanisms of reflex contracture of the anterior abdominal wall.  
Fiziol.zhur. 44 no.1:45-51 Ja '58 (MIRA 11:3)

1. Kafedra normal'noy fiziologii Meditsinskogo instituta, Kazan.  
(ABDOMINAL WALL, physiology,  
contraction mechanism (Rus))

ZEFIROV, L.N., KOCHNEV, O.S.

Participation of acetylcholine in the process of accommodation and parabiosis of a nerve trunk [with summary in English]. Biol. eksp. biol. i med. 45 no.4:3-7 Ap '58 (MIRA 11:5)

1. Iz kafedry normal'noy fiziologii (ispolnyayushchaya obyazannosti zaveduyushchego - doktor med.nauk I.N. Volkova) Kazanskogo meditsinskogo instituta. Predstavlena doystvitel'nyy chlenom AMN SSSR V.N. Chernigovskim.

(ACETYLCHOLINE, effects

on accomm. & parabiosis in sciatic nerve in frog (Rus))

(NERVES, physiology

accomm. & parabiosis in isolated frog nerve, eff. of acetylcholine (Rus))

ZEFIROV, L.N.; POLETAYEV, G.I.

Effect of 2-methylnaphthoquinone on various elements of the  
nerve-muscle apparatus in cold-blooded animals. Biul.eksp.  
biol. i med. 47 no.6:68-72 Je '59. (MIPA 12:8)

1. Iz kafedry fiziologii (zav. - doktor med.nauk I.N.Volkova)  
Kazanskogo meditsinskogo instituta. Predstavlena doystvitel'-  
nym chlenom AMN SSSR V.N.Chernigovskim.

(VITAMIN K, eff.

on nerve-musc. prep. (Rus))

(NERVE MUSCLE PREPARATION, eff. of drugs on  
vitamin K (Rus))

ZEFIROV, L.N.; POLETAYEV, G.I.

Effect of pancreatectomy and of acetylcholine on the peripheral reflex arch in cold-blooded animals. Biul.eksp.biol. i med. 48 no.7:3-6 J1 '59. (MIRA 12:10)

1. Iz kafedry fiziologii (zav. - doktor med.nauk I.N.Volkova) Kazanskogo meditsinskogo instituta. Predstavlena deystvitel'nyim chlenom AMN SSSR V.N.Chernigovskim.

(PANCREAS - physiology)

(ACETYLCHOLINE - pharmacology)

(MYONEURAL JUNCTION - physiology)

ALATYREV, V.I.; ZEFIROV, L.N.

Effect of diplacin on the phasic and tonic activity of the neuro-muscular apparatus in frogs. Nauch. trudy Kaz. gos. med. inst.  
14:71-72 '64. (MIRA 18:9)

1. Kafedra fiziologii (zav. - prof. I.N.Volkova) Kazanskogo meditsinskogo instituta.

ZEFIROV, L.N.

Importance of acetylcholine in the synaptic transmission of excitation. Nauch. trudy Kaz. gos. med. inst. 14:179-180 '64.

(MIRA 18:9)

1. Kafedra fiziologii (zav. - prof. I.N.Volkova) Kazanskogo meditsinskogo instituta.

ZEFIROV, L.N.

Mechanism of tetanized single responses and post tetanic changes  
of irritability in nerve trunks. Fiziol. zhur. 50 no.3:319-327  
Mr '64. (MIRA 18:1)

1. Kafedra normal'noy fiziologii Meditsinskogo instituta, Kazan'.

ALATYREV, V.I.; ZEFIROV, L.N.

Effect of acetylcholine metabolism disorders on the dynamics of  
threshold cathodic parabiosis and functional resistance of a  
nerve trunk. Biul. eksp. biol. i med. 55 no.3:6-10 Mr '63.

(MIRA 18:2)

1. Iz kafedry normal'noy fiziologii (zav. - prof. I.N. Volkova)  
Kazanskogo meditsinskogo instituta. Submitted April 9, 1962.



ZEFIROV, L.N.

Characteristics in the development of parabiosis caused by  
changes in the nerves induced by choline-active substances.  
Fiziol. zhur. 49 no.9:1092-1098 S '63. (MIRA 17:12)

1. Kafedra normal'noy fiziologii Meditsinskogo Instituta, Kazan'.

ZEFIROV, L.N.

Simple method for the production of paired impulses and the study  
of refractiveness. Fiziol. zhur. 46 no.10:1295-1297 0 '60.

(MIRA 13:11)

1. Kafed'a normal'noy fiziologii meditsinskogo instituta, Kazan'.  
(ELECTROPHYSIOLOGY) (NERVES)

ZEFIROV, I.N.; TUKHVATULLINA, L.V.

Effect of 2-methylnaphthoquinone on the parasympathetic innervations and activity of the heart of cold-blooded animals. Biul. eksp. biol. i med. 49 no. 4:71-75 Sp '60.

(MIRA 13:10)

1. Iz kafedry fiziologii (zav. - doktor meditsinskikh nauk I.N. Volkova) Kazanskogo meditsinskogo instituta.  
(VITAMIN S-K) (HEART)

84872

S/079/60/030/010/008/030  
B001/B075

11.12.10

AUTHORS: Yur'yev, Yu. K., Zefirov, N. S., and Minacheva, M. Kh.

TITLE: Investigation of the Furan Series. VIII. Tetramethylfuran  
in Diene Synthesis<sup>1</sup>

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 10,  
pp. 3214-3217

TEXT: Following the papers of Refs. 1-9 on the behavior of furan and its derivatives in diene synthesis, the authors studied the behavior of tetramethylfuran in diene synthesis. On the basis of Refs. 10-11, they assumed that diene synthesis in the furan series proceeds according to the ionic mechanism. They observed a vigorous reaction of tetramethylfuran with fumaric nitrile. The principal purpose of the present work was to determine the qualitative difference between the reactivities of tetramethylfuran and furan, and to select those dienophiles which react only with the former. Thus, it was found that tetramethylfuran reacts with methyl maleic anhydride under the formation of a crystalline adduct, whereas furan, 2-methylfuran, and 2,5-dimethylfuran do not react with this dienophile. Chloro- and bromo maleic anhydrides, together with tetramethyl-  
Card 1/2

84872

Investigation of the Furan Series. VIII. Tetramethyl- S/079/69629/019008/030  
furan in Diene Synthesis B001/B075

furan, lead to the corresponding addition products, contrary to the non-reactive phenyl maleic anhydride. Phenyl- $\beta$ -benzoyl-vinyl sulfone and phenyl- $\beta$ -acetyl-vinyl sulfone also react with tetramethylfuran only. However, contrary to the former, the latter reacts with the furan itself. Thus, it is shown that there is a great difference between the reactivity of tetramethylfuran and that of furan. Attempts to react the former with dimethyl maleic anhydride, benzal malonic acid ester, acrolein, methyl isopropenyl ketone, acrylonitrile, and cinnamic acid aldehyde failed. Apparently, tetramethylfuran and furan are not so reactive as to react with dienophiles whose double bond is activated only from one side (Refs. 14-16). H. Wienhnhhaus and H. Dässlep (Ref. 17) used menthofuran for the reaction with acrolein and crotonic acid aldehyde, taking this reaction for a diene synthesis. The failure of the authors' attempt to react tetramethylfuran with acrolein indicates that the data mentioned by the authors (Refs. 15, 16) are possibly incorrect. Further investigations are therefore necessary. There are 17 references: 5 Soviet, 9 US, and 3 German.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet  
(Moscow State University)

SUBMITTED: November 20, 1959

Card 2/2

AUTHORS: Yur'yev, Yu. K., Belyakova, Z. V., Zefirov, N. S. 79-12-19/43

TITLE: Tetraacyloxysilanes in Organic Synthesis  
(Tetraatsiloksisilany v organicheskom sinteze).  
X. Comparative Effect of Catalysts on the Occasion of Acylation  
Reaction of Benzene and Thiophene With Tetraacyloxysilanes  
(Sravnitel'noye deystviye katalizatorov v reaktsii atsiliro-  
vaniya benzola i tiofena tetraatsiloksisilanami).

PERIODICAL: Zhurnal Obshchey Khimii 1957, Vol. 27, Nr 12, pp. 3264-3270  
(USSR)

ABSTRACT: In the present work the comparative effect of a series of  
catalysts in the acylation reaction of thiophene with tetra-  
acetoxysilane with the mixed anhydride of the orthosilicic  
acid and acetic acid is investigated. The cabality of reacting  
of the two anhydrides to be expected was examined in order  
to known whether the actual acylation of thiophene, selenophene  
and benzene is due to the silico-anhydrides of the organic  
acids only or whether also chloroanhydrides participate, since  
they also occur on the occasion of the reaction of silicium-  
tetrachloride on the siliciumanhydride which has already  
formed (see formulae!). The acylation of thiophene with the  
above anhydride does not only occur under the presence of

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79-12-19/43

Tetraacyloxysilanes in Organic Synthesis.  
X. Comparative Effect of Catalysts on the Occasion of Acylation  
Reaction of Benzene and Thiophene With Tetraacyloxysilanes.

anhydrous zinc beryllium chloride and boron fluoride, with yields of 25,5-46,5 % but also under the presence of tetra- titanium chloride with a yield of 93,5 %. The acylation of benzene with anhydride occurs under the presence of anhydrous aluminium chloride, as well as of anhydrous iron chloride. No acylation of benzene takes place under the presence of anhydrous zinc chloride, beryllium chloride, boron fluoride and titanium tetrachloride. The acylation of benzene and thiophen leads to the same results in the solvent with pure mixed anhydride of silicic and acetic acid, gained from siliciumtetra- chloride and acetic acid anhydride, also from silicium tetra- chloride and acetic acid with the same results, which is a convincing prove that the acylating agent is in fact the anhydride. On this basis the acylation process of the thiophen nucleus could be proved by means of the mentioned anhydrides. There are 2 tables and 33 references, 9 of which are Slavic.

Card 2/3

Tetraacyloxysilanes in Organic Synthesis.  
X. Comparative Effect of Catalysts on the Occasion of Acylation  
Reaction of Benzene and Thiophene with Tetraacyloxysilanes.

79-12-19/43

ASSOCIATION: Moscow State University  
(Moskovskiy gosudarstvennyy universitet).

SUBMITTED: November 22, 1956

AVAILABLE: Library of Congress

1. Tetraacyloxysilanes - Synthesis
2. Benzene - Chemical reactions
3. Thiophene - Chemical reactions
4. Cyclic compounds - Chemical reactions

Card 3/3



YUR'YEV, Yu.K.; ZEFIROV, N.S.; PRIKAZCHIKOVA, I.P.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 11:

Cis-hydroxymercuration of dimethyl ester of

exo-cis-3,6-endoxo- $\Delta^4$ -tetrahydrophthalic acid. Zhur.ob.khim.

33 no.6:1793-1801 Je '63.

(MIRA 16:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.  
(Cyclohexenedicarboxylic acid) (Mercuration) (Stereochemistry)

ZEFIROV, N.S.; KADZYAUSKAS, P.P.; YUR'YEV, Yu.K.; BAZANOVA, V.N.

Chlorination stereochemistry of 5-chloromercuric derivatives of dimethyl ester of 7-oxabicyclo[2,2,1]-2,3-heptanedicarboxylic acid. Zhur. ob. khim. 35 no.8:1499-1500 Ag '65. (MIRA 18:8)

1. Moskovskiy gosudarstvennyy universitet.

ZEFIROV, N.S.; YUR'YEV, Yu.K.; PRIKAZCHIKOVA, I.P.; BYKHOVSKAYA, M.Sh.

3,6-Endoxo-cyclohexanes and -cyclohexenes. Part 12: Stereochemistry  
of nucleophilic addition on a C=C bond in the systems of  
3,6-endoxo-cyclohexene and 3,6-endoxo-cyclohexadiene. Zhur.ob.khim.  
33 no.7:2153-2158 J1 '63. (MIRA 16:8)  
(Cyclohexene) (Cyclohexadiene) (Stereochemistry)

ZEFIROV, N.S.; DAVYDOVA, A.F.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 23: Stereochemistry of chlorination of dimethyl esters of 3,6-endoxotetrahydrophthalic and -dihydrophthalic acids in nonpolar solvents. (MIRA 18:8)  
Zhur. ob. khim. 35 no.8:1372-1377 1965.

1. Moskovskiy gosudarstvennyy universitet.

YUR'YEV, Yu.K.; ZEFIROV, N.S.; SHTEYNMAN, A.A.

Furan series. Part 26: Relation between the reaction of diene  
synthesis and substitution addition in the furan series. Zhur.ob.  
khim. 33 no.4:1150-1156 Ap '63. (MIRA 16:4)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.  
(Furan) (Unsaturated compounds) (Substitution (Chemistry))

YUR'YEV, Yu.K.; ZEFIROV, N.S.

3,6-Endoxo-cyclohexens and -cyclohexanes. Part 8:  
Wagner-Meerwein rearrangement during the halogenation of  
derivatives of 3,6-endoxo-cyclohexene, 3,6-endoxo-cyclohexene..  
Zhur.ob.khim. 33 no.3:804-813 Mr '63. (MIRA 16:3)

1. Moskovskiy gosudarstvennyy universitet imeni  
M.V. Lomonosova.  
(Cyclohexene) (Halogenation)  
(Rearrangements (Chemistry))

YUR'YEV, Yu.K.; ZEFIROV, N.S.; SHAYDEROVA, L.P.

3,6-Endoxo-cyclohexanes and -cyclohexenes. Part 10:  
Acetoxymercuration of dimethyl ester of  
3,6-endoxo- $\Delta^7$ -tetrahydrophthalic acid. Zhur.ob.khim.  
33 no.3:818-820 Mr '63. (MIRA 16:3)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.  
(Cyclohexened icarboxylic acid)  
(Mercuration)

ZEFIROV, N.S.; IVANOVA, R.A.; FILATOVA, R.S.; YUR'YEV, Yu.K.

Deamination of methyl ester of exo-cis-2-amino-3,6-endo-  
hexahydrophthalic acid. Zhur.ob.khim. 33 no.10:3440-3441  
O '63. (MIRA 16:11)

1. Moskovskiy gosudarstvennyy universitet.



ZEFIROV, N.S.; IVANOVA, R.A.; FILATOVA, R.S.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 26: Wagner.  
Meerwein rearrangement in decarboxylation of 3,6-endoxocyclohexyl-  
anthranilic acid and its methyl ester. Zhur. ob. khim. 35  
no.10:1798-1801 O '65. (MIRA 18:10)

1. Moskovskiy gosudarstvennyy universitet.

ZEFIROV, N.S.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 27: Reaction of  
 $\gamma$ -elimination in the series of halo derivative esters of  
3,6-endoxohexahydrophthalic acid. Zhur. ob. khim. 35 no.10:  
1802-1806 O '65. (MIRA 18:10)

1. Moskovskiy gosudarstvennyy universitet.

L 1817-66 EWT(m)/EPF(c)/ENP(j) RM

ACCESSION NR: AP5025127

UR/0079/65/035/010/1807/1811  
547.592.12.2:547.463

AUTHOR: Zefirov, N. S.; Filatova, R. S.; Yur'yev, Yu. K.

TITLE: 3,6-Endooxacyclohexanes and -cyclohexenes. 28. Reactions of exo- and endo-dimethyl esters of 1-bromo-7-oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid

SOURCE: Zhurnal obshchey khimii, v. 35, no. 10, 1965, 1807-1811

TOPIC TAGS: oxabicyclic compound, heterocyclic compound, reaction mechanism, solvolysis

ABSTRACT: This work is a continuation of research on bicyclic compounds bearing a halogen atom at the bridge. Nucleophilic substitution is usually strongly inhibited in this class of compounds. Reactions following the  $SN_2$  mechanism cannot take place because the back-side approach of the nucleophile preceeding the Walden inversion is prevented. The  $SN_1$  reactions, on the other hand, require the formation of a planar carbonium-ion intermediate, prevented by the rigid cage structure. It was of interest to determine whether more stable carbonium ions could be formed by bridge-halogenated oxabicyclic compounds, in which the carbonium ion would be stabilized by the adjacent ether function. The preparation of the exo(I) and

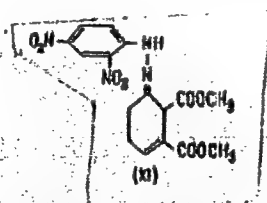
Card 1/3

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ACCESSION NR: AP5025127

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endo-dimethyl esters of 1-bromo-7-oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid(II) had been described in an earlier paper. Solvolysis of both I and II is extremely slow. Boiling of I and II with aqueous ethanol in the presence of silver nitrate does not produce a precipitate of silver bromide, not even after several hours. Treatment with sodium acetate in acetic acid causes cis-trans isomerization of I. Alkaline hydrolysis leads to saponification without removing the bromine atom. Treatment of I and II with sodium methoxide in methanol, however, produced a rapid appearance of bromide ions in solution. An unstable oil is formed which readily yields a 2,4-dinitrophenylhydrazone. Infrared and ultraviolet spectral data indicate that the structure of the hydrazone is



Orig. art. has: 2 formulas.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

[VS]

Card 2/3

L 1817-66

ACCESSION NR: AP5025127

SUBMITTED: 23Dec64

ENCL: 00

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OTHER: 012

ATD PRESS: 411

Card 3/3

ZEFIROV, N.S.; PRIKAZCHIKOVA, L.P.; BONDAREVA, M.A.; YUR'YEV, Yu.K.

Hydroxymercuration of dimethyl ester of exo-1-methoxy-3,6-endoxo-  
 $\Delta^4$ -trans-tetrahydrophthalic acid. Zhur.ob.khim. 33 no.12:4026-  
4027 D '63. (MIRA 17:3)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

ZEFIROV, N.S.; IVANOVA, R.A.; KECHER, R.M.; YUR'YEV, Yu.K.

Bromination of adducts of 2-methyl- and 2,5-dimethylfuran  
with maleic anhydride. Zhur.ob.khim. 33 no.10:3439-3440  
O '63. (MIRA 16:11)

1. Moskovskiy gosudarstvennyy universitet.

ZEFIROV, N.S.; PRIKAZCHIKOVA, L.P.; YUR'YEV, Yu.K.

Stereochemistry of the addition of mercury salts to olefins  
studied by the use of the mercury salt of trinitromethane.  
Dokl. AN SSSR 152 no.4:869-871 O. '63. (MIRA 16:11)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.  
Predstavleno akademikom A.N. Nesmeyanovym.



YUR'YEV, Yu.K.; ZEFIROV, N.S.; IVANOVA, R.A.

3,6-Endoxo-cyclohexanes and cyclohexenes. Part 9:  
Synthesis of amino derivatives of the 3,6-endoxo-cyclohexane  
series. Zhur.ob.khim. 33 no.3:813-817 Mr '63. (MIRA 16:3)

1. Moskovskiy gosudarstvennyy universitet imeni  
M.V. Lomonosova,

(Cyclohexene)  
(Amino compounds)

5.3400

77861  
SOV/79-30-2-12/78

AUTHORS: Yur'yev, Yu. K., Zefirov, N.S., Shteynman, A. A., Gurevich, V. M.

TITLE: Study of the Furan Series. III. Reaction of 2-Methyl- and 2-Ethylfuran with Mesityl Oxide

PERIODICAL: Zhurnal obshchei khimii, 1960, Vol 30, Nr 2, pp 411-415 (USSR)

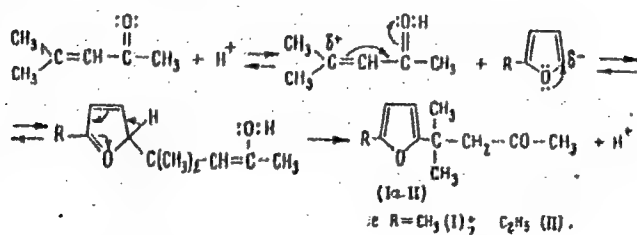
ABSTRACT: The authors synthesized 1,1-dimethyl-1-(5-methylfuryl-2) butanone-3 (I) and 1,1-dimethyl-1-(5-ethylfuryl-2) butanone-3 (II) by reacting mesityl oxide with 2-methyl- and 2-ethylfuran, respectively, demonstrating that the furan ring can react with  $\beta$ ,  $\beta$ -dimethylvinyl group of the  $\alpha$  -  $\beta$ -unsaturated ketones (see scheme A).

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Study of the Furan Series. III. Reaction of 2-Methyl- and 2-Ethylfuran with Mesityl Oxide

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Scheme A

This reaction was conducted in a round-bottom flask provided with a mixer and a reflex condenser. The reaction mixture (the reagents were dissolved in hydroquinone) was heated for 8 hr on the water bath. The reaction mass was then diluted with ether, washed with sodium carbonate and water, and dried over CaCl<sub>2</sub>. The best catalysts were found to be concentrated sulfuric acid and boron trifluoride etherate. Repeated distill-

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Study of the Furan Series. III. Reaction of 2-Methyl- and 2-Ethylfuran with Mesityl Oxide

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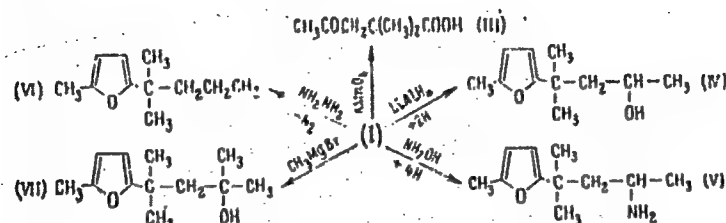
ation yielded the addition products. Characteristics of 1,1-dimethyl-1-(5-methylfuryl-2)butanone-3 (I): bp 106-107° (15 mm);  $n_D^{20}$  1.4700;  $d_4^{20}$  0.9723; its semicarbazone, white leaflets; mp 136-137°, 2,4-dinitrophenylhydrazone, yellow needles; mp 109.5-110°, was characterized by infrared spectrum. The 1,1-dimethyl-1-(5-ethylfuryl-2)butanone-3 (II): bp 114° (13 mm);  $n_D^{20}$  1.4682;  $d_4^{20}$  0.9577; 2,4-dinitrophenylhydrazone, orange needles; mp 90.5-91°, characterized by infrared spectrum. Reactions of prepared ketones were studied on example of 1,1-dimethyl-1-(5-methylfuryl-2)butanone-3. Scheme B shows the reactants and the products of the five reactions studied.

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Study of the Furan Series, III. Reaction of 2-Methyl- and 2-Ethylfuran with Mesityl Oxide

77861

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Scheme B

The constants of the derived compounds: (1)  $\alpha$ ,  $\alpha$  dimethyllevulinic acid (III): mp 76-76.5°; (2) 1,1-dimethyl-1-(5-methylfuryl-2)butanol-3 (IV), bp 106° (10 mm),  $n_D^{20}$  1.4770,  $d_4^{20}$  0.9690, characterized by infrared spectrum; (3) 1,1-dimethyl-1-(5-methylfuryl-2)-3-aminobutane (V), bp 104-105° (10 mm),  $n_D^{20}$  1.4580,  $d_4^{20}$  0.8814; (4) 1,1-

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Study of the Furan Series. III. Reaction of 2-Methyl- and 2-Ethylfuran with Mesityl Oxide

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-dimethyl-1-(5-methylfuryl-2)butane (VI): bp 75-76° (20 mm),  $n_D^{20}$  1.4529,  $d_4^{20}$  0.8738; (5) 1,1,3-trimethyl-1-(5-methylfuryl-2)butanol-3 (VII): bp 89-90° (6mm),  $n_D^{20}$  1.4800,  $d_4^{20}$  0.9703. The authors thank L. A. Kazitsyna for measurement of spectra. There are 8 references, 3 Soviet, 3 German, 1 French, 1 U.S. The U.S. reference is Ch. A., 47, 1744 (1953).

ASSOCIATION: Moscow State University (Moskovskiy gosudarstvennyy universitet)

SUBMITTED: February 4, 1959

Card 5/5

ZEFIROV, N.S.; DAVYDOVA, A.F.; YUR'YEV, Yu.K.

Cis-bromination of dimethyl ester of 3,6-endoxodihydrophthalic acid. Zhur. ob. khim. 34 no. 5:1681 My '64. (MIRA 17:7)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

ZEFIROV, N.S.

Stereochemistry of hydroxymercuration of olefins. Usp. Khim.  
34 no.7:1272-1292 J1 '65. (MIRA 18:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.



ZEFIROV, N.S.; KRUTETSKAYA, G.P.; PRIKAZCHIKOVA, L.P.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and endoxo cyclohexenes. Part 24: Dipole moments of dimethyl ester derivatives of 3,6-endoxohexahydrophthalic acid. Zhur. ob. khim. 35 no.9:1687-1690 S '65.

(MIRA 18:10)

1. Moskovskiy gosudarstvennyy institut.

ZEFIROV, N.S.; FILATOVA, R.S.; YUR'YEV, Yu.K.

Behavior of dimethyl ester of 3-bromo-3,6-endoxohexahydro-  
phthalic acid in solcolysis. Zhur. ob. khim. 34 no.7:  
2468-2469 JI '64 (MIRA 17:8)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.

ZEFIROV, N.S.; IVANOVA, E.A.; YUR'YEV, Y.L.V.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 17: Configuration of the adducts of 2-methyl- and 2,5-dimethylfuran with maleic anhydride and their epoxydation. Zhur. ob. khim. 35 no.1:58-61 Ja '65. (MIRA 18:2)

1. Moskovskiy gosudarstvennyy universitet.

ZEFIROV, N.S.; IVANOVA, R.A.; KECHER, R.M.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 18: Wagner-Meerwein rearrangement during halogenation of 3-methyl- and 3,6-dimethyl-3,6-endoxocyclohexenedicarboxylic acids. Zhur. ob. khim. 35 no.1: 61-67 Ja '65. (MIRA 18:2)

1. Moskovskiy gosudarstvennyy universitet.

YUR'YEV, Yu.K.; ZEFIROV, N.S.; MINACHEVA, M.Kh.

Furan series. Part 8: Tetramethylfuran in the reaction of diene  
synthesis. Zhur.ob.khim. 30 no.10:3214-3217 0 '61. (MIRA 14:4)

1. Moskovskiy gosudarstvennyy universitet.  
(Furan)

YUR'YEV, Yu.K.; ZEFIROV, N.S.

Furan series. Part 21: Wagner-Meerwein rearrangement in  
3,6-endoxocyclohexane. Zhur.ob.khim. 32 no.3:773-782  
Mr '62. (MIRA 15:3)  
(Norbornane) (Rearrangements)

YUR'YEV, Yu.K.; ZEFIROV, N.S.

Furan series. Part 15: Stereochemistry of the addition to  
the C=C bond in the series of 3,6-endoxocyclohexene. Zhur.  
ob. khim. 31 no.4:1125-1131 Ap '61.. (MIRA 14:4)

1. Moskovskiy gosudarstvennyy universitet.  
(Endoxocyclohexene)

YUR'YEV, Yu.K.; ZEFIROV, N.S.; GUREVICH, V.M.

Furan series. Part 19: Reactions of alkylfurans with -unsaturated ketones. Zhur. ob. khim. 31 no. 11:3531-3534 N '61. (MIRA 14:11)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.  
(Furan) (Ketones)



5.3600

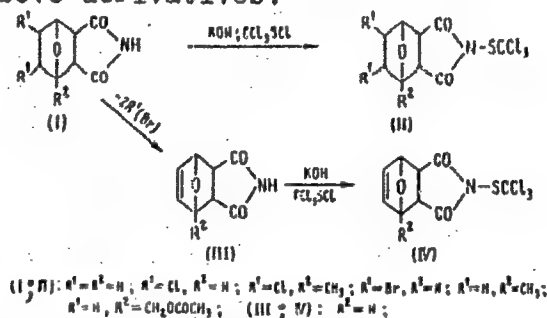
78270  
SOV/79-30-3-24/69

AUTHORS: Yur'yev, Yu. K., Zefirov, N. S.

TITLE: Investigation of Furan Series. V. Synthesis of Derivatives of N-Trichloromethylmarcaptoimide of 3,6-Endoxohexahydrophthalic Acid

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 3, pp 855-859 (USSR)

ABSTRACT: The following two methods were used in the synthesis of the above derivatives.



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## Investigation of Furan Series. V.

78270

SOV/79-30-3-24/69

The reaction of perchloromethylmercaptan with an alkaline solution of the imide of 3,6-endoxyhexahydrophthalic acid or its derivatives is preferred because of a high yield (80-90%) of corresponding N-trichloromethylmercapto derivatives (without forming the amide salt). The following compounds were synthesized: N-trichloromethylmercaptoimide of exo-3,6-endoxohexahydrophthalic acid, mp 157.5-158°; N-trichloromethylmercaptoimide of exo-3,6-endoxo- $\Delta^4$ -tetrahydrophthalic acid (yield 83%), mp 132-132.5°; N-trichloromethylmercaptoimide of exo-4,5-dibromo-3,6-endoxohexahydrophthalic acid (yield 87%), mp 184-185°; N-trichloromethylmercaptoimide of exo-4,5-dichloro-3,6-endoxohexahydrophthalic acid (yield 81%), mp 169.5-170°; N-trichloromethylmercaptoimide of 3-methyl-3,6-endoxohexahydrophthalic acid (yield 85%), mp 148.5-149°; N-trichloromethylmercaptoimide of 4,5-dichloro-3-methyl-3,6-endoxohexahydrophthalic acid (yield 83%), mp 214-215°; N-trichloromethylmercaptoimide of 3-acetoxymethyl-3,6-endoxohexa-

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Investigation of Furan Series. V.

78270

SOV/79-30-3-24/69

hydrophthalic acid (yield 78%), mp 158°. There are 17 references, 13 U.S., 2 Soviet, 2 German. The 5 most recent U.S. references are: Groxall W., Shropshire, E., Lo C., J. Am. Chem. Soc., 75, 5420 (1953); Stoltz E., Rogers C., Ch. A., 48, 9085 (1954); Kittleson A., J. Agr. Food Chem., 1, 677 (1953); Berson, J., Swidler R., J. Am. Chem. Soc., 76, 4060 (1954); Kwart H., Burchuk J., J. Am. Chem. Soc., 74, 3094 (1952).

ASSOCIATION: Moscow State University (Moskovskiy gosudarstvennyy universitet)

SUBMITTED: March 12, 1959

Card 3/3

5(3)

AUTHORS:

Yur'yev, Ya. K., Zefirov, N. S.

SOV/79-29-9-31/76

TITLE:

Investigation in the Series of Furan.  
II. Reaction of Compounds of the Furan Series with the  
Diethyl Ester of Azodicarboxylic Acid

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 9, pp 2954-2960  
(USSR)

ABSTRACT:

On the basis of a number of papers quoted in references 1-30 the authors investigated the reactions of the diethyl ester of azodicarboxylic acid with furan, 2-methyl furan (silvane), and furyl alcohol. After the experiments were finished, P. Baranger and J. Levisalles (Ref 8) published a paper describing the failed experiment in which the attempt had been made to cause furan, 2-methyl furan, and 2,5-dimethyl furan to react with the above ester. The mentioned research workers did not succeed in isolating the formed adducts and in carrying out an alkali and acid hydrolysis of the reaction products. In the experiment described the reaction of furan and 2-methyl furan with the above ester was found to proceed like a diene synthesis in which compound (I) and, accordingly, (II) result qualitatively. A large quantity of ether

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## Investigation in the Series of Furan.

SOV, 79-29-9-31/76

## II. Reaction of Compounds of the Furan Series With the Diethyl Ester of Azodicarboxylic Acid

has to be used for these reactions as without a solvent they would proceed vigorously and cause resinification. Adducts (I) and (II) are non-crystalline, solid, glassy products, softening in powder form at 50-60°, in contrast to the adduct of the same ester with the diacetate of furfurole (Ref 9). The adducts (I) and (II) add easily to bromine, yielding glassy dibromides (III). The reaction with phenyl azide (Refs 31-32) leads to a crystalline triazoline derivative (IV), but only in the adduct (I). Hydrogen is added to the adducts (I) and (II) which yield dark, glassy products (V). In vacuum distillation a pyrolysis takes place (compound (VI)). When heated with phosphorus pentoxide (I) and (II) resinify, developing CO<sub>2</sub>, ethylene and forming a small amount of diethyl ester of hydrazo dicarboxylic acid, which in turn decomposes under the formation of ethylene, CO<sub>2</sub>, and nitrogen. The chemical properties of the adducts (I) and (II) and especially the formation of the crystalline addition product of phenyl azide to adduct (I) indicate that the reaction of

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Investigation in the Series of Furan.

SOV/79-29-9-31/76

II. Reaction of Compounds of the Furan Series With the  
Diethyl Ester of Azodicarboxylic Acid

furan and silvane with azodicarboxylic ester proceeds  
according to the normal diene synthesis. There are 1 figure  
and 35 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State  
University)

SUBMITTED: July 17, 1958

Card 3/3

~~ZEFIROV, N.S.~~  
YUR'YEV, Yu.K.; BELYAKOVA, Z.V.; ZEFIROV, N.S.

Tetraacyloxysilanes in the organic synthesis. Part 10: Comparative action of the catalysts in the acylation reaction of benzene and thiophene with tetraacyloxysilanes. Zhur. ob. khim. 27 no.12:3264-3271 D '57. (MIRA 11:3)

1. Moskovskiy gosudarstvennyy universitet.  
(Catalysis) (Benzene) (Thiophene) (Acylation)

ZEFIROV, N.S.

YUR'YEV, Yu.K.; YEL'YAKOV, G.B.; ZEFIROV, N.S.; VYSOKOSOV, A.N.

Tetraacyloxysilanes in organic synthesis. Part 8. Silicic anhydrides of saturated monobasic organic acids in the synthesis of ketones of the thiophene series. Zhur.ob.khim. 26 no.12:3341-3344 (MLRA 10:7) D '56.

1. Moskovskiy gosudarstvennyy universitet.  
(Silicic anhydrides) (Ketones)



ZEFIROV, N.S.; DAVYDOVA, A.F.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 21: Stereochemistry of bromination of 3,6-endoxodihydrophthalic acid and its dimethyl ester. Zhur. ob. khim. 35 no.5:814-822 My '65. (MIRA 18:6)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

ZEFIROV, N.S.; PRIKAZCHIKOVA, L.P.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 22: Stereochemistry of oxymercuration of dimethyl ester of 1-methoxy-3,6-endoxotetrahydrophthalic acid. Zhur. ob. khim. 35 no.5:822-827 My '55.  
(MIRA 18:6)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

YUR'YEV, Yu.K.; ZEFIROV, N.S.; OSADCHAYA, R.A.

Furan series. Part 17: Synthesis of amino alcohols of the  
3,6-endooxocyclohexane. Zhur.ob.khim. 31 no.9:2898-2902 S '61.  
(MIRA 14:9)

1. Moskovskiy gosudarstvennyy universitet.  
(Cyclohexane) (Alcohols)

YUR'YEV, Yu.K.; ZEFIROV, N.S.

Furan series. Part 14: Reactivity of  $\alpha$ -oxides of the 3,5 endo-methylene- and 3,6-endoxoclohexane series. Zhur. ob. khim. 31 no.3:840-844 Mr '61. (MIRA 14:3)

1. Moskovskiy gosudarstvennyy universitet.  
(Norbornane)

YUR'YEV, Yu.K.; ZEFIROV, N.S.; SHTEYNMAN, A.A.; RYBOYEDOV, V.I.

Furan series. Part 10: 2-Methylfuran in a reaction of substitutive addition with  $\alpha, \beta$ -unsaturated aliphatic ketones. Zhur. ob. khim. 30 no.11:3755-3759 N°60. (MIRA 13:11)

1. Moskovskiy gosudarstvennyy universitet.  
(Furan) (Ketones)

YUR'YEV, Yu.K.; ZEFIROV, N.S.

Furan series. Part 13: New stereospecific method of synthesizing cyclitols. Zhur. ob. khim. 31 no. 2:685-686 (1961).

(U.S. 14:2)

(Cyclitols)

YUR'YEV, Yu.K.; ZEFIROV, N.S.; PRIKAZCHIKOVA, L.P.

Stereochemistry of the oxymercuration of dimethyl ester of *exo-cis*-3,6-*endo*- $\Delta^8$ -tetrahydrophthalic acid. Zhur.ob.khim. 32 no.8:2744-2745 Ag '62. (MIRA 15:9)

1. Moskovskiy gosudarstvennyy universitet.  
(Phthalic acid) (Mercuration) (Stereochemistry)

ZEFIROV, N. S.

Dissertation defended for the degree of Candidate of Chemical Sciences  
at the Institute of Organic Chemistry imeni N. D. Zelinskiy in 1962:

"Compounds of the Furnace Series in the reaction of Diene Synthesis and  
Substitutional Additions."

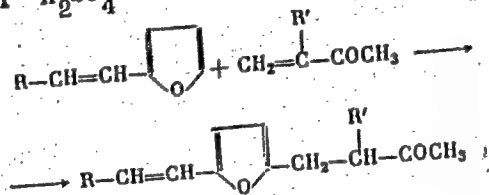
Vest. Akad. Nauk SSSR.

No. 4, Moscow, 1963, pages 119-145



S/079/61/031/011/003/015  
D202/D305

AUTHORS: Yuri'yev, Yu. K., Zefirov, N. S., and Gurevich, V. M.  
TITLE: Investigation of the furan series XIX. The reaction of 2-vinyl furans with  $\alpha, \beta$ -unsaturated ketones  
PERIODICAL: Zhurnal obshchey khimii, v. 31, no. 11, 1961, 3531-3534  
TEXT: In this work, the authors found that 2-vinyl furan reacts with  $\alpha, \beta$ -unsaturated ketones which have a substituted methyl group, in the presence of traces of  $H_2SO_4$  as a catalyst, according to the scheme:



(I)  
Ia R = R' = H; Ib R = C<sub>6</sub>H<sub>5</sub>, R' = H; Ic R = H, R' = CH<sub>3</sub>.

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D202/D305

Investigation of...

where  $R = H$ , or  $C_3H_7$ ,  $R_1 = H$  or  $CH_3$ . Similar furan derivatives react in the same way; as those reactions proceed with the formation of resinous side-products, the yield is low, but the method is considered an easy way of preparing furan ketones. Ketones substituted with 2-furyl acetylene were not prepared. The ketones obtained react with maleic anhydride giving additional products. Hydration of the vinyl side chain of furan proceeds smoothly when palladium or  $BaSO_4$  are used as a

catalyst, and it is easy to obtain an additional product linked to the furan vinyl double bond. Preparation of the following compounds is given: 2-vinyl furan, by a previously known method. Reaction of vinyl furan with thiophenol: a mixture of 4.2 g of thiophenol and 3.8 g of vinyl furan was left in a closed vessel for a few days; the product distilled in vacuo yielded 7.5 g of sulfide (92%); b.p.  $146 - 148^\circ C$  (6 mm);

$n_D^{20}$  1.5811;  $d_4^{20}$  1.0017;  $MR_D$  60.88, calcul. 60.22.  $C_{12}H_{12}OSF_5$

[Abstracter's note: "F" probably means fraction], 1-(5-vinyl furyl-2)-butanone-3 (cpd. Ia). To a flask containing 0.2 g of hydroquinone,

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D202/D305

14 g of methyl vinyl acetone and 2 drops of conc.  $H_2SO_4$ , 14.1 g of 2-vinyl furan was added (at  $\leq 25^\circ C$ ). The mixture was stirred for 1 hour, diluted with ether, washed with  $NaHCO_3$  and water, and dried over anhyd.  $MgSO_4$ ; the yield was 5 g (20.5%) after distillation in vacuo in a stream of nitrogen; b.p.  $109-110^\circ C$  (5 mm);  $n_D^{20}$  1.5171;  $d_4^{20}$  1.0301;  $MR_D$  48.22; calcul. 46.39. The additional product of Ia ketone and maleic anhydride: 0.82 g of Ia was added to a concentrated solution of 0.49 g of maleic anhydride in absolute ether; after 12 - 15 hours, white crystals were formed, with b.p.  $110 - 111^\circ C$  (from benzene). They decomposed after a few hours in contact with air. 2-methyl-1-(5-vinyl furyl-2)-butanone-3 was obtained in the same way, as compound Ia, from 14.1 g vinyl furan and 16.4 g of methyl iso-propylene ketone, yielding 5.1 g of the product; b.p.  $105 - 107^\circ C$  (9 mm);  $n_D^{20}$  1.5080;  $d_4^{20}$  1.0390;  $MR_D$  52.16; calcul. 51.01;  $C_{11}H_{14}O_2F_3$ . By the same method, 1-(5-pente-

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D202/D305

nyl-1-furyl-2)-butanone-3 was obtained from 20.4 g pentenyl furan and 14 g methyl vinyl ketone; the yield = 6.8 g (23%); b.p. 121 - 122° (5 mm);  $n_D^{20}$  1.5081;  $d_4^{20}$  1.0511;  $MR_D$  82.29; calcul. 60.29. 2-ethyl furan was obtained from 9.4 g of vinyl furan, hydrated in 50 ml of methyl alcohol with 0.1 g Pd on BaSO<sub>4</sub> (5% Pd). After the amount of H<sub>2</sub>, equivalent to one double bond has been absorbed, the hydration reaction stopped abruptly. The yield was 8.7 g (90%); physical properties were in good agreement with data given in Western literature. 1-(5-ethyl furyl-2)-butanone-3 was prepared by two methods: (a) 3.5 g of ketone 1<sub>2</sub> in 40 ml of methanol were hydrated as above, with yield of 2.95 g (81%); b.p. 95° (5 mm);  $n_D^{20}$  1.4726;  $d_4^{20}$  0.9986;  $MR_D$  46.67; calcul. 46.88. (b) From 9.6 g of ethyl furan and 10.5 g methyl vinyl ketone with 0.15 ml of concentrated H<sub>2</sub>SO<sub>4</sub> by a method described previously for the preparation of 2-methyl furan. 8.6 g of compound identical with that

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obtained by method (a) given above. The above experiments prove that the reactions of alkenyl furans with unsaturated ketones belong to the type of addition-substitution ones. There are 15 references: 6 Soviet-bloc and 9 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: J. Webb, G. Borchardt, U.S. Pat. 2,640,057 (1953); J. Bachman, L. Heisey, J. Am. Chem. Soc. 71, 1085 (1949); D. Coffman, P. Barrick, R. Creamer, M. Reach, J. Am. Chem. Soc. 71, 490, (1949); E. Breault, O. Dremer, Ch. A., 43, 2615 (1949).

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
(Moscow State University im. M. V. Lomonosov)

SUBMITTED: December 16, 1960

Card 5/5

YUR'YEV, Yu.K.; ZEFIROV, N.S.

Jolivet's work "Study of 3,6-endoxo- $\Delta^4$ -tetrahydrophthalic anhydride" reviewed by I.U.K.Iur'ev, N.S. Zefirov. Zhur. ob. khim. 31 no. 11:3840-3841 N '61. (MIRA 14:11)

1. Moskovskiy gosudarstvennyy universitet.  
(Phthalic anhydride)

FEDOROV, A. (Voronezh); ZEFIROV, V. (Sverdlovsk); TEREKHOV, N. (Moskva);  
RYABCHIKOV, A. (Nizhniy Tagil)

Repaired by amateurs. Radio no. 2:51 F '63,  
(Television—Maintenance and repair)  
(Radio—Maintenance and repair)

(MIRA 16:2)

ZEFIROV, N.S.; PRIKAZCHIKOVA, L.P.; YUR'YEV, Yu.K.

3,6-endoxocyclohexanes and -cyclohexenes. Part 20: Acetoxymercuration of demethyl ester of 3,6-endoxodihydrophthalic acid. Zhur. ob. khim. 35 no.4:639-641 Ap '65.

(MIRA 18:5)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.



ZEFIROV, N.S.; KADZYAUSKAS, P.P.; BAZANOVA, V.N.; YUR'YEV, Yu.K.

Stereochemistry of the nitrosochlorination of 2,3-dicarbomethoxy-  
7-oxabicyclo-[2,2,1]-5-heptene. Zhur. ob. khim. 35 no.4:752-753  
Ap '65. (MIPA 18:5)

1. Moskovskiy gosudarstvennyy universitet im. V.M. Lomonosova.

ZEFIROV, Yu.N.

Changes in the activity of cholinesterase of whole blood in acute leukemia in children. Vop. gemat. v pediat. no.3:310-316 '64.

Changes in the cholinesterase activity of the blood elements in lymphogranulomatosis in children. Ibid.:439-447

(MIRA 18:7)

ZEFIROVA, A.

Pepsin-----

Consultation. Mias ind. 23 no, 4, J1-Ag '52

Monthly List of Russian Accessions, Library of Congress, December 1952 UNCLASSIFIED

80661

S/153/60/003/02/09/034  
B011/B003

5.3200

AUTHORS: Burlakova, Ye. B., Dzantiyev, B. G., Zefirova, A. K.,  
Sergeyev, G. B., Emanuel', N. M.

TITLE: The Thermal and Radiolytic Oxidation of Methyl Oleate<sup>1</sup>

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i  
khimicheskaya tekhnologiya, 1960, Vol. 3, No. 2,  
pp. 265-271

TEXT: The authors studied the kinetics of the accumulation of products of the thermal and radiolytic oxidation of the methyl oleate by atmospheric oxygen at 50 - 120°. For this purpose a vessel was used which was analogous to that described in Ref. 10. The peroxide amount was determined iodometrically. The acids were determined by titration of the oxidate dissolved in neutral ethanol with an 0.05 N-solution of alcohol-alkali solution. An x-ray apparatus of type RUP 1-M-2, 200 kW was used as radiation source. Air was blown through at a rate of 5 - 7 l/h. The authors proved that the principal amount of the oxidation products is formed by conversion of the hydroperoxides (Refs. 1-4).

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80561

The Thermal and Radiolytic Oxidation  
of Methyl Oleate

S/153/60/003/02/09/034  
B011/B003

A large amount of oxides was also found, however. The authors assume that in addition to peroxides, oxides represent primary oxidation products of the methyl oleate. Furthermore, the authors studied the decomposition kinetics of the organic peroxides in dependence on the oxidation time of the methyl oleate (Fig. 3). They determined that peroxides decompose after the reaction of second order. The constant of the decomposition rate decreases with the intensity of oxidation (Fig. 3). The authors pointed out that a short radiation effect on the oxidation process is mainly expressed by the reduction of the induction period of the peroxide-, acid-, and oxide formation. The reduction in the induction period is proportional to the radiation dose (Fig. 5) in the case of peroxides, but is independent of the radiation dose in the case of oxides. Finally, the authors proved that the amount of peroxide yield subject to radiation is largely dependent on temperature (Fig. 7). The elimination of the radiation source strongly effects the kinetics of the accumulation of peroxides at comparatively low temperatures. Above 80° this influence cannot be observed (Fig. 6). The authors thank Professor N. A. Bakh, and

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The Thermal and Radiolytic Oxidation  
of Methyl Oleate

80661

S/153/60/003/02/09/034  
B011/B003

B. B. Sarayeva for having supplied the radiation source. There are 8  
figures and 15 references, 6 of which are Soviet. ✓

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M. V.  
Lomonosova; Kafedra khimicheskoy kinetiki (Moscow State  
University imeni M. V. Lomonosov; Chair of Chemical  
Kinetics)

SUBMITTED: August 4, 1958

Card 3/3

89731

5.3700 2209, 1153, 1164

S/020/61/136/003/015/027  
B016/B052

AUTHORS: Zefirova, A. K. and Shilov, A. Ye.

TITLE: Kinetics and Mechanism of the Interaction Between Aluminum Alkyls and Titanium Halides

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 3, pp. 599-602

TEXT: The authors report on the interaction mechanism and on the structure of particles taking part in the reduction process of the following compounds:  $(C_5H_5)_2TiCl_2$  with 1)  $Al(C_2H_5)_3$ , 2)  $Al(CH_3)_3$ , and 3)  $Al(C_2H_5)_2Cl$  (the examination of 3) was started together with E. W. Randall and L. E. Sutton in Oxford). Ad 1): in this fast reaction titanium is reduced under the formation of a light blue complex (4):  $(C_5H_5)_2TiCl_2 \cdot Al(C_2H_5)_2$ . Ethane forms in amounts which correspond to half of the  $(C_5H_5)_2TiCl_2$  used, thus corresponding to a disproportionation of the ethyl groups. Ethylene

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89731

Kinetics and Mechanism of the Interaction  
Between Aluminum Alkyls and Titanium Halides

S/020/61/136/003/015/027  
B016/B052

always forms in smaller amounts than ethane. Butane is not formed. Aluminum alkyls and  $\text{TiCl}_4$  show a similar reaction although titanium here is reduced to valences lower than 3+. The lower yields of ethylene are generally explained by its partial polymerization. The authors found that the products of reaction 1) yield approximately 20% of butane by the decomposition by water. They explain this by the fact that ethylene enters the Me-C bond only once during the reduction. Ad 2): titanium is slowly reduced when toluene solutions of the reagents are mixed. The light blue complex (4) does not form. The red coloring rapidly turns light blue in the presence of ethylene. Thus, methane is liberated and ethylene is absorbed. The complex of the type (4) is sublimable and has the empirical formula of  $(\text{CH}_3)_2\text{AlCl} \cdot (\text{C}_5\text{H}_5)_2\text{TiCl}$ . Propylene, butylene-1, amylene-1, and other  $\alpha$ -olefins react in a similar way, and approximately equimolar amounts of ethylene are absorbed. From the formation of propane and butane during the decomposition of the reaction products by water (in the presence of ethylene), the authors conclude that the reaction takes place in accordance with the scheme of disproportionation of the alkyl groups. Here, however, the olefin first enters the Me-C bond and forms a

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89731

Kinetics and Mechanism of the Interaction  
Between Aluminum Alkyls and Titanium Halides

S/020/61/136/003/015/027  
B016/B052

disproportionable alkyl radical. The olefins formed during the disproportionation also enter the Me-C bond. Ad 3): the reaction follows the known scheme of Refs. 1,3 at a measurable rate. From Fig. 1 the authors conclude that the reaction proceeds according to order  $1/2$  until a conversion of 70-80% is reached. Then it follows the first order. On the basis of their own results and the published data, the authors regard the free radical reaction mechanism of the above reduction of titanium halide as being refuted. However, they mention a number of data supporting the ion mechanism. The scheme enclosed illustrates the reaction mechanism suggested by the authors. There are 2 figures and 8 references: 2 Soviet, 4 US, 1 British, and 1 International.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: July 3, 1960, by V. N. Kondrat'yev, Academician

SUBMITTED: July 20, 1960

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89731

8/020/61/136/003/015/027  
B016/B052

- 0)  $[Al (C_2H_5)_2 Cl]_2 \rightleftharpoons Al (C_2H_5)_2^+ + Al (C_2H_5)_2 Cl_2^-$
- 1)  $2 (C_2H_5)_2 TiCl_2 + [Al (C_2H_5)_2 Cl]_2 \rightleftharpoons 2 (C_2H_5)_2 TiCl_2 \cdot Al(C_2H_5)_2 Cl (II)$
- 2)  $II \rightleftharpoons (C_2H_5)_2 Ti (C_2H_5)_2 Cl \cdot Al (C_2H_5)_2 Cl_2 (III)^+$
- 3)  $III \rightleftharpoons (C_2H_5)_2 Ti C_2H_5^+ + Al (C_2H_5)_2 Cl_2^-$
- 4)  $(C_2H_5)_2 Ti C_2H_5^+ + Al (C_2H_5)_2 Cl_2^- \rightarrow (C_2H_5)_2 Ti (C_2H_5)_2 + Al(C_2H_5)_2 Cl_2$
- 4')  $(C_2H_5)_2 Ti (C_2H_5)_2 + Al (C_2H_5)_2^+ \rightarrow (C_2H_5)_2 Ti C_2H_5 + Al (C_2H_5)_2$
- 5)  $(C_2H_5)_2 Ti (C_2H_5)_2 \rightarrow (C_2H_5)_2 Ti + C_2H_6 + C_2H_4$
- 6)  $(C_2H_5)_2 Ti + II \rightarrow (C_2H_5)_2 TiCl + (C_2H_5)_2 Ti Cl_2 Al (C_2H_5)_2$

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8/020/60/132/05/30/069  
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5.3831  
5.3100

AUTHORS:

Zefirova, A. K., Tikhomirova, N. N., Shilov, A. Ye.

TITLE:

The Structure of Some Products of the Interaction of  
Aluminum Alkyls With Derivatives of Titanium (IV)

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 5,  
pp. 1082 - 1085

TEXT: The authors have extended their previously (Ref. 1) observed rule governing the spectra of paramagnetic electron resonance (PER) of the products of the reaction of tri-isobutylaluminum with dicyclopentadienyl-titanium dichloride, to other compounds. Thus they have been able to draw some conclusions on the structure of the reaction products. They analyzed the interaction of aluminum alkyls and aluminum aryls:  $\text{Al}(\text{C}_2\text{H}_5)_3$ ,  $\text{Al}(\text{C}_6\text{H}_5)_3$ ,  $\text{Al}(\text{Iso-C}_3\text{H}_7)_3$ ,  $\text{Al}(\text{CH}_3)_3$ ,  $\text{Al}(\text{Iso-C}_4\text{H}_9)_3$ ,  $\text{Al}(\text{C}_2\text{H}_5)_2\text{Cl}$ , with derivatives of titanium (IV):  $(\text{C}_5\text{H}_5)_2\text{TiCl}_2$ ,  $(\text{C}_5\text{H}_5)_2\text{TiBr}_2$ ,  $(\text{C}_5\text{H}_5)_2\text{TiI}_2$ . With a reagent ratio of 1 : 1 in a toluenic

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The Structure of Some Products of the Inter- S/020/60/132/05/30/069  
action of Aluminum Alkyls With Derivatives of B011/B126  
Titanium (IV)

solution, similar PER signals were received in all cases. Their  $g$ -factor was 1.975. With lower concentrations of the reagents (under  $1 \cdot 10^{-3}$  M/l), the signals have a characteristic appearance (Fig. 1), which can be explained by the presence of an undefined super-fine structure. It can be seen from the PER spectra of other Al/Ti ratios that all Al-alkyls and Al-aryls can be divided into two groups. The signals I (Fig. 1) for  $\text{Al}(\text{CH}_3)_3$ ,  $\text{Al}(\text{C}_6\text{H}_5)_3$ , and  $\text{AlCl}(\text{C}_2\text{H}_5)_2$  are not noticeably changed by a rising Al/Ti ratio. On the other hand, new signals form with the remaining Al-alkyls and -aryls, which have a well defined super-fine structure. On a change in these systems from an Al : Ti ratio of 1 : 1 to  $\sim 20 : 1$ , the signals I change into signals II (Fig. 2a). This latter is a doublet with a  $g$  factor of 1.985. If the ratio is increased further to  $\sim 50 : 1$ , signal II is converted into signal III. Here  $g = 1.988$  and there are eight components. In the Al-alkyls of the second group, the form of signals II and III is as independent of the nature of the alkyl as it is from the nature of the halogen atom in titanium halide. The conversion  $\text{I} \rightarrow \text{II} \rightarrow \text{III}$  led the authors to suppose that the Al-alkyls

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The Structure of Some Products of the Inter-  
action of Aluminum Alkyls With Derivatives of  
Titanium (IV)

contain similar admixtures, whose quantity equates that of the titanium derivative when the Al/Ti ratio is raised, and which forms new complexes therewith. Such admixtures can be hydrides which easily form in the first group of substances analyzed, but which are totally absent in the second group. The authors tested and confirmed this hypothesis. In this case the doublet II can be explained by splitting on the hydrogen atom of the complex, which contains one molecule of  $\text{AlH}(\text{Iso-C}_4\text{H}_9)_2$ . It can be seen from Fig. 3a that signal III consists of some six equally intensive lines and two lines which are three to four times less intense. Here, the super-fine structure has a natural explanation: the molecule of the reaction product contains two H atoms from two molecules of the Al-hydride. Figs. 2b and 3b show the PER spectra of the products of the reaction of  $\text{AlD}[\text{CH}_2\text{CD}(\text{CH}_3)_2]_2$  with  $(\text{C}_5\text{H}_5)_2\text{TiCl}_2$ . From this it follows that, due to the substitution of D for H, the super-fine structure completely disappears in both cases. The authors draw conclusions on the structure of the complex produced, from their results and from data in

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The Structure of Some Products of the Inter-  
action of Aluminum Alkyls With Derivatives of  
Titanium (IV) <sup>81702</sup> S/020/60/132/05/30/069  
BO11/B126

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AS USSR for discussions, and O. P. Okhlobystin and V. V. Gavrilenko  
(Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of  
Elemental-organic Compounds of the AS USSR)) for help in the syntheses.  
There are 3 figures and 4 references: 2 Soviet and 2 American.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR  
(Institute of Physical Chemistry of the Academy of  
Sciences, USSR)

PRESENTED: February 1, 1960, by V.N. Kondrat'yev, Academician

SUBMITTED: January 29, 1960

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SOV/76-33-9-35/37

5(4)

AUTHORS:

Shilov, A. Ye., Zefirova, A. K., Tikhomirova, N. N.

TITLE:

Paramagnetic Electron Resonance in the System  
 $\text{Al}(\text{iso-C}_4\text{H}_9)_3 - \text{Ti}(\text{C}_5\text{H}_5)_2\text{Cl}_2$

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 9,  
 pp 2113 - 2114 (USSR)

ABSTRACT:

A. Ye. Shilov and N. N. Bubnov (Ref 1) found paramagnetic electron resonance absorption (PERA) with a g-factor of about two in the precipitate formed by the reaction of aluminum trialkyls with titanium chlorides. The homogeneous system  $\text{Al}(\text{iso-C}_4\text{H}_9)_3$  (I) -  $\text{Ti}(\text{C}_5\text{H}_5)_2\text{Cl}_2$  (II) in toluene was investigated here at room temperature. At the applied concentration of (I) of  $2 \cdot 10^{-4}$  mol/l and ratios of (I):(II)=2:1, 10:1, 50:1 and 100:1, the authors found resonance absorption (Fig 1). The results lead to the assumption that the free electrons are located on the atoms of Al or Ti in the system under discussion. The number of basic lines of the hyperfine structure of the (PERA)-spectrum (Fig 2) indicates that the free electron reacts with the nucleus possessing a spin of 5/2, which would

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Paramagnetic Electron Resonance in the System  
 $\text{Al}(\text{iso-C}_4\text{H}_9)_3 - \text{Ti}(\text{C}_5\text{H}_5)_2\text{Cl}_2$

SOV/76-33-9-35/37

correspond to the Al atom. In this connection, the free electron interacts with two protons and a hyperfine structure of the spectrum is formed due to fission on the atoms of Al and H. In conclusion, the authors thank L. I. Zakharkin and V. V. Gavrilenko for supplying substance (I). There are 2 figures and 1 Soviet reference.

SUBMITTED: February 6, 1959

Card 2/2



ZEFIROVA, G. S.

Addison's disease caused by inadequate ACTH secretion alone. Cas. lek.  
cesk 100 no.15:456-463 14 Ap '61.

1. Katedra endokrinologie, ved. prof. N. A. Seresevskij, zasl. ved.  
pracovník, UDL; red. M. D. Kovriginova, Moskva.

(ADDISON'S DISEASE etiol)  
(CORTICOTROPIN defic)

MIRZAYANTS, G.G.; VESHNEVA, I.V.; ZEFIROVA, G.S.; KHAYKINA, M.B.

Klinefelter's syndrome. Vest. AMI SSSR 20 no.3:17-20 '65.  
(MIRA 12:7)

1. Institut morfologii cheloveka AMN SSSR i Tsentral'nyy  
institut usovershenstvovaniya vrachey, Moskva.

ZEFIROVA, G.S. (Moskva)

Pregnancy and labor in Addison's disease. Probl. endokr. gormonoter. 9 no.4:103-105 J1-Ag'63 (MIRA 17:1)

1. Iz kafedry endokrinologii (ispolnyayushchiy obyazannosti zaveduyushchego - dotsent L.N.Anosova) TSentral'nogo instituta usovershenstvovaniya vrachey ( rektor M.D.Kovrigina) na baze Klinicheskoy ordena Lenina bol'nitsy imeni S.P. Botkina (glavnyy vrach Yu.G.Antonov), Moskva.

ZEFIROVA, G.S.

The treatment of chronic adrenal cortex insufficiency. Stud. cercet. endocr. 13 no.6:773-784 '62.

1. De la Catedra de endocrinologie a Institutului central de perfectionare a medicilor (Sef de catedra: docent L.N. Anosova).  
(ADRENAL CORTEX HYPOFUNCTION) (ADDISON'S DISEASE)  
(ADRENAL CORTEX HORMONES)

ZEFIRVA, G.S.

Disorders of carbohydrate metabolism and the possibility of  
using insulin in Addison's disease. Probl.endok. 1 gorm.  
no.2:87-90'63. (MIRA 16:7)

1. Iz kafedry endokrinologii (ispolnyayushchaya obyazannosti  
zav. - dotsent L.N.Anosova) Tsentral'nogo instituta usover-  
shenstvovaniya vrachey na baze Klinicheskoy ordena Lenina  
bol'nitsy imeni S.P.Botkina (glavnyy vrach Yu.G.Antonov).  
(ADDISON'S DISEASE) (INSULIN)  
(CARBOHYDRATE METABOLISM)

ANOSOVA, L.N., dotsent; ZEFIROVA, G.S., MOSKOVICH, E.G.

Treatment of diabetes mellitus. Vrach. delo no.4:79-85 Ap'63.  
(MIRA 16:7)

1. Kafedra endokrinologii (zav.-prof.YeA.Vasyukova) Tsentral'-  
nogo instituta usovershenstvovaniya vrachey i endokrinologi-  
cheskoye oddeleniye klinicheskoy bol'nitsy imeni S.P.Botkina,  
Moskva.

(DIABETES)

ZEFIROVA, G.S.

Addison's disease associated with arterial hypertension, Sov.  
med. 27 no.1:41-45 Ja '64. (MIRA 17:12)

1. Kafedra endokrinologii (ispolnyayushchiy ob'yazannosti zav.-  
dotsent L.N. Anosova) Tsentral'nogo instituta usovershenstvovaniya  
vrachey (direktor M.D. Kovrigina) na baze Klinicheskogo ordena  
Lenina bol'nitsy imeni S.P. Botkina (glavnyy vrach Yu.G. Antonov),  
Moskva.

ZEFIROVA, G.S.; USPENSKIY, V.I., red.

[Addison's disease] Addisonova bolezni'. Moskva, Medgiz,  
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1. Iz kafedry endokrinologii (ispolnyayushchiy obyazannosti  
zaveduyushchego - dotsent L.N. Anosova) Tsentral'nogo insti-  
tuta usovershenstvovaniya vrachey na baze Bol'nitsy imeni  
S.P. Botkina (glavnyy vrach Yu.G. Antonov).

ZEFIROVA, G.S. (Moskva)

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nauki prof. N.A. Shereshevskiy [deceased]) Tsentral'nogo insti-  
tuta usovershenstvovaniya vrachey (dir. M.D. Kovrigina).  
(ADRENAL CORTEX--DISEASES)

ZEFIROVA, G.S.; POKROVSKIY, V.I. (Moskva)

Characteristics of the course of Addison's disease in children.  
Vop. okh. mat. i det. 7 no.2:37-41 F '62. (MIRA 15:3)

1. Iz kafedry endokrinologii (zav. - prof. N.A. Shereshevskiy)  
TSentral'nogo instituta usovershenstvovaniya vrachey (dir.  
M.D. Kovrigina) i kafedry infektsionnykh bolezney (zav. - prof.  
N.I. Bunin) I Moskovskogo ordena Lenina meditsinskogo instituta  
imeni I.M. Sechenova.

(ADDISON'S DISEASE)

MOSKOVICH, E.G.; ZEFIROVA, G.S.

Electrocardiographic changes in young diabetes mellitus patients.  
Sov. med. 25 no.7:53-58 J1 '61. (MIRA 15:1)

1. Iz kafedry endokrinologii (zav. - zasluzhennyi deyatel' nauki  
prof. N.A.Shereshevskiy [deceased]) Tsentral'nogo instituta  
usovershenstvovaniya vrachey (dir. V.P.Lebedeva) i Klinicheskoy  
bol'nitsy imeni S.P.Botkina (glavnyy vrach - prof. A.N.Shabanov).  
(ELECTROCARDIOGRAPHY) (DIABETES)